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Infrastructure in India: Issues in the New Millennium

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I. Introduction

The pursuit of higher level of welfare for the citizens of a country in the era of globalisation does require efficiency, productivity and growth in all spheres of economic activities. In this respect, the importance of adequate and efficient infrastructure is justified by its impact on efficiency and growth of economic activities, and in turn, on the welfare of the society. The higher affluence of the developed countries with advanced infrastructure proves this relationship and developing countries are experiencing rising demand for infrastructure in their pursuit of development.

Apart from growth linkages, infrastructure has direct relationship with environment, health, poverty, equity and the general quality of life. The typical feature of developing country is abundant population, poor infrastructure and the vast expansion of the commodity production system resulting in pollution of environment, poor health, low quality of life, inequalities in income and wealth, and the breakage of the co-existence of man and nature. Therefore planned development of infrastructure is must for sustainable development of mankind itself.

In the recent decade, infrastructure has attracted attention worldwide. The economies aiming at growth and development in an era of global structural reforms and global interlinkages consider inadequate and inefficient infrastructure as a major bottleneck. Let us examine the issue of infrastructural problems faced by India in this scenario.

II. Infrastructure and the plans

India, on attaining independence, accorded highest importance to the development of infrastructural facilities. The successive plans were formulated on such lines that the infrastructural sectors claimed the lion's share of the plan outlays and actual expenditures (Table 1). The shares were 80% in the First Plan, dropped to 64% in the Second and Third Plans, and to 58% during the Annual Plans, increased again to 64% in the Fourth and Fifth Plans. But thereafter it dropped again to 62% in the Annual Plan and 57% in Sixth Plan. The share thereafter increased to 58% in Seventh Plan, 62% in Eighth Plan, 70% in the Ninth Plan, and 67.4% in the Tenth Plan. If all the ten plans along with the annual plans are considered together, it is observed that of the Total Allocated Spending of Rs. 3395483 Crores, the infrastructural sectors claimed Rs. 2245291 Crores, i.e. more than 66% of the total. The highest share went to the Transport and Communication sector, followed by the Power sector.

It has been because of such paramount importance being attached to the development of the infrastructure in our economic planning that long strides have been made in the physical availability of such facilities in India. There has been a remarkable growth in the absolute level of such facilities, as well as in the level relative to the size of the nation and population, i.e. in standardized forms.

However, the progress is not that much commendable if we compare it to global standards (Table 3). In fact we lag far behind not only from the developed nations, but also from the average of the middle-income countries, to which group we belong. This has to be addressed sincerely.

Moreover, we also face the problems of regional imbalance in availability of infrastructural facilities. This has seriously affected our proclaimed objective of balanced regional development. It is in this backdrop that we are examining some of the issues facing the infrastructural sector in India in the new millennium.

III. Areas of Concern – Sectoral Issues

Infrastructure include vast spectrum of services and utilities that provide support to directly productive activities or human development. This broad sector can be subdivided into sectors that cater to specific needs. We have identified here six sub sectors of infrastructure - Agricultural, Power, Transport, Financial, Educational and Health. The first three can be viewed as Physical infrastructure while the last two as Social infrastructure. There are specific areas of concern for each of the sub-sectors of infrastructure in India. Let us outline them briefly.

Agricultural infrastructure, especially expansion of State-funded irrigation projects, has stagnated in the recent years. The small and medium irrigation projects are not undertaken with due importance. Moreover, the maintenance and upkeep of the canals and tanks have become irregular and very often are victims of gross neglect. Frequent breaches in the canals, especially during the monsoon season, often causes great loss to both life and property. The focus now has been more on encouraging the use of private irrigation efforts by subsidizing and reducing user charges of electricity or diesel for pump sets. The shift from Canal/tank irrigation to pump set driven system is a sign of withdrawal of the State as provider of irrigation services. This has created major problems for the small and marginal farmers who cannot bear the financial burden of the capital cost for pump sets etc. This has resulted in greater inequality in the countryside - thereby negating the gains of Land and Tenancy Reforms.

The Electricity sector has expanded commendably in India. Generating capacity is adequate and availability of power, in the urban areas at least, has become assured to some extent. Rural electrification has not been up to the mark if one goes by the regularity and 'voltage availability' factors rather than percentage of villages electrified. However, major area of concern has been the neglect of maintenance of crucial machinery, transformers, supply lines, etc. As a result, Transmission and Distribution losses are high. Added to such losses are factors like illegal connection ('hooking' and 'tapping' in local parlance), faulty meters, collusion between officials and customers leading to non-collection of bills, etc. As a result, a considerable portion of the power generated does not earn any revenue for the electricity boards and most of them are facing financial insolvency. Unless urgently addressed to, the viability of the total system will break down. There has also been no serious effort to use non-conventional methods of power generation. Given the length, breadth and diversity of the nation, waterpower, solar-power, wind-power and tidal power could have been used as

complementary or even alternative to thermal power. This would also alleviate many of the environmental concerns associated with effluents of the thermal power plants and using up substantial volume of ground and surface water.

The Transport and Communication sector is undergoing a transformation. There has been an enormous expansion of the modern communication sector. People of even remote areas can now contact people over the telephone all around the world, and gone are the days when one had to 'book' a 'trunk call' and wait half a day for the call to materialize. Expansion of Cellular Mobile phones, Rural Public Call Offices, and other physical measures of 'teledensity' has been remarkable. The cost efficiency and reliability are to be improved in coming days. However, the Transport sector needs much improvement. The ideal situation would be a complementary relation between the roads and the railways with the later used for long haul and the former for short distance freights. But alarmingly a competitive relation has emerged and the road transport has eroded away half of the long-haul traffic of the railways. There has also been a trend towards improving and modernizing the long distance National and State highways and expressways, at the cost of unrepaired, narrow and badly maintained local roads. Adoption of populist policies like subsidizing the passenger traffic by the goods traffic in the railways has not helped the case either. Apart from economic losses, this trend has serious environmental fallout also. A greater concern has been the financial state of the railways, which is finding it increasingly difficult to maintain tracks, rolling stock, signalling and safety devices, etc.

The Financial infrastructure sector is still very much biased towards urban areas and towards medium and large customers. Financial services are inaccessible, inadequate and inefficient in the rural areas. Small investors or borrowers find themselves neglected, unwanted and cornered. They lack any bargaining power and are taken for a ride by the system. Various scams in the recent years have only added to the worries of the common people with the perpetrators of crime going scot-free and repeating their acts. The formal credit system has favoured the already haves and not the needy.

The Educational infrastructure sector has expanded tremendously as far as the physical assets like schools and colleges are concerned. But the system itself has been lopsided. There has been a tremendous growth of the higher education system while the elementary education system has been starved for resources. The primary school buildings are in shambles, and, more often than not, there are no permanent structures. There are very few trained teachers compared to the number of pupils. The curriculum is unscientific and top-down, and the teaching methods are so rigid that they favour neither creativity nor applicability. The general higher education system is highly subsidized - with the monthly fees of graduate and postgraduate classes being a fraction of daily wages of manual labourers. While India has the world's largest manpower of trained scientific personnel and graduates, it also has the world's largest mass of illiterates and semi-literates. This inequality of capability is a major hindrance to our process of development.

The Health system has an urban focus inherent in it. Basic facilities are not readily available in rural areas and PHCs and RHCs are more than eager to pass on any serious or difficult case to the nearest urban hospital. Being highly subsidized, the government health care system is poorly maintained and often lacks even basic medicines and routine treatment and operating facilities. While those who can afford are visiting private clinics, the poor and marginal groups find themselves shut out of the health care system. The thrust is more on cure rather than prevention and is reactionary rather than proactive. The system is also unresponsive to local needs, and, more often than not, are found wanting in efficiency, compassion and responsibility.

IV. Financial Constraints and Issue of Privatisation

So far we have discussed specific problems plaguing the different infrastructural sectors in India. However, all the infrastructural sectors in general are suffering from a common problem - that of Resource Availability and Financing. As has already been discussed, the accepted position since the advent of independent planning in India has been that infrastructural sectors are not profitable and the provision of those services has to be the responsibility of the State. Theoretically this is justified by the '*Social Good*' character of these services and the related *External Economies*. However, this method is facing increasing problems because of excess demand, inefficient services, failure of the Government to upgrade technology and inefficient management of infrastructural projects. The state had to shoulder the financial burden of providing such services, which have become more and more costly over time. There was no effort to recover 'user charges' or even any analysis to gauge the prices that the users are willing to pay. Consequently, these sectors have always been a drain on the public exchequer. As the resource crunch became more and more serious, the allocation of funds to these sectors slowed down. The available funds were increasingly used to start new projects to bolster the image of the ruling political party rather than in proper maintenance and upgradation of existing facilities. This seriously affected the quality and reliability of the services. Moreover, the State is increasingly unable to meet the rising demand for such services. Private entrepreneurs are unwilling to step in, as they have to either compete with existing subsidized and cheap government services, or suffer operational losses by cutting their prices. This has led us to a situation where we are facing several bottlenecks in the infrastructural sectors. This is proving to be a roadblock to our development process, and, unless we take up an active role, progress in the immediate future may be stalled.¹ It has been estimated that the total investment needs of the infrastructural sector would be around \$350 billion during 1996 to 2006 period, if it has to keep up with projected and planned GDP growth. The State had not been in a position to arrange such huge amount of resources. Consequently, private sector financing has been facilitated and encouraged in the infrastructural sector.

This has taken two forms - private financing & private operation, and private financing of government operations. The former scores over the later in terms of efficiency, punctuality and reliability of services. But there has to be cautions also. Whereas operation and supply have been in

private hands, demand in cases of power has to be routed through the government agencies. This requires certain counter guarantees in the form of 'Take-or-Pay' procedures, where the State guarantees a minimum payment whatever be the actual demand/purchase. All such deals must be transparent and should go to the lowest-cost bidders. The project contracts must also specifically mention time frame of completion and penalties for time-over runs. The government must also ensure that environmental concerns are properly addressed, and resultant price structure does not cause exploitation of the marginal and the poorer sections of the people. On the other hand, private financing of government projects may ensure certain degree of accountability on part of the government. When the financier or sponsor monitors the implementation and operation of a project, performance and efficiency are ensured to some extent. As his returns are at stake, he takes interest in the functioning of the project and pushes the generally sloth and truant government functionaries to deliver profits.

V. The Issue of Commercialisation and Pricing Policy

Even if privatisation is the new buzzword, the state will continue to play a dominant role in financing infrastructural projects in India. In such cases, the government must understand and accept that the services provided are 'industries', and not mere extensions of the bureaucracy. Various economists have commented that bureaucratic logjam and red-tapism has led to severe delay, misallocation, time and cost overrun, non-economic operation and inefficient functioning of infrastructural services in India. It is argued that many of these ills can be removed by Commercialisation of this sector.

The main stay of commercialisation process is a paradigm shift in Pricing policy. The pricing policy must be based on economic and commercial considerations rather than only on social considerations. It is often said that the poor people cannot afford actual user charges. But the ground reality is that the subsidized rates help the middle- and high-income groups, whereas the poor are shut out of the services by barriers other than prices. Thus, there may be a differential price policy - but that should not discriminate subjectively between social or economic groups. Differential prices must be based on 'Block Tariff' policy, where a subsidized rate is charged for first few units of service (called the 'lifeline' rate) so that the poor can access the commodity. Beyond that, the rates must be taxed to recoup the subsidy - so that rich or heavy users pay more than the cost. This will make the projects sustainable without sacrificing the goals of social equity. Differentiation on the basis of 'place-of-use' may also be made so that ability and willingness to pay determine prices. Demand may also be spread out more evenly by adopting 'Time-of-use' structure of pricing, where peak-demand-time rates are highest. The Telecom sector uses this policy and the Railways have initiated such schemes in the 2003 Railway Budget.

Whatever be the pricing policy, revenue earned from tariffs must recover costs. It must be kept in mind that lags in tariff revision or unwillingness to do so may yield short term political gains, but allows demand to grow out of proportion and risks the creation of shortages and bottlenecks.

However, it has to be remembered that commercialisation results in a complete shift in the economic framework under which the services are provided. Proper monitoring by competent authorities is a necessary condition for success of such policies.

VI. Project Selection, Implementation and Management

The question that we are facing is not whether infrastructure is required, since it can be fairly concluded that infrastructure is a pre-condition for development. Rather, it is about what, where and how much, and also those regarding how to finance new projects and how to maintain operations of the existing ones. All these need proper planning and implementation. A few suggestions regarding this may be extended.

The ‘what’ and ‘where’ of infrastructural projects has mostly been an administered decision with the Central and State Planning Bodies deciding where to build the next road, bridge, power plant, school and hospital. Such decisions of creating and expanding the infrastructural services should have been based on rigorous cost-benefit analysis and estimating the actual and potential demand. However, that has not been the case in India. There has been a plethora of new projects being initiated with the existing resources being too thinly spread among them. To prevent such misallocation of scarce resources one must stress on a handful of projects at a time. Those that can be adequately financed with the given resources should be initiated and completed within given time frame. Only then, newer projects should come up.

The planning and implementation process must be decentralized² with sufficient user and community participation. The community organizations (Panchayats, Block Committees and Zilla Parishads) must be revamped, revitalized and made functional. They should be allocated the resource and asked to come up with plans regarding projects to be initiated. As a result, only priority projects will be chosen. Community participation will also ensure speedy, efficient and cost-effective completion of projects, and create a feeling of ownership among the users. This will help in proper operation and maintenance of the service also.

The size, magnitude or expanse of infrastructural services should be based on actual demand. Very often, high market demand has been cited as a reason for expanding certain services. What has been overlooked is that the demand is at a certain market price, which does not reflect the cost of providing the service, and is only a negligible fraction of user-charges. When the services are under-priced to such extent, market demand does not reflect society’s actual need. Only if the users are required to pay prices that reflect the cost can actual demand be estimated. This vital information regarding true need for the service should be taken into account before deciding the size, magnitude or expanse of the services.

VII. Performance of Public Utilities

One major concern regarding infrastructure in India has been their performance. Being run by the state, they resemble the bureaucracy more than service-providers. Commercial management,

Competition and Shareholders' participation - the three key factors for good and sustainable performance as noted by the World Development Report (WDR 1994), are virtually unheard of. This philosophy has to be replaced by proper monitoring of performances so that the projects become self-sustainable. Suggested steps should begin with fixing explicit performance goals for such projects in commercial, quantitative, qualitative, and 'reach' terms.

Other than proper pricing policies, performance can also be improved by allowing competition. The perpetual monopoly of the state in providing the services is a major cause for their inefficient functioning, and direct competition with private providers should improve their performance. Such arrangements can be made in case of Power, Highways, Bridges, Hospitals, etc., with modifications tailored to suit each specific sector.

Another major advice would be that the maintenance and proper & regular repair of the infrastructural assets must get due importance. It has been the practice in India to neglect maintenance and repair, and use the funds for laying foundation stones of new projects. However, the returns from investment on maintenance and repair are far higher than the returns from investment on new projects.

VIII. Macroeconomic Feasibility

Commercialisation of Infrastructural services and Public-Private partnership cannot by itself remove infrastructural bottlenecks. Wide range of macroeconomic factors limit investment in and expansion of these services. Long term macroeconomic planning is needed to estimate the infrastructural needs compatible with future growth targets. It should then identify the sources of investment - both domestic and external. Tapping of domestic savings, channelling private savings towards public projects, optimally directing external assistance are some of the necessary important steps. One must also decide about the fiscal incentives required to boost investment and types of regulation and monitoring required. Judicious use of borrowed funds is called for so that future flow of returns exceeds future outflow of repayments and both External Balance and comfortable Debt-GDP ratio is maintained. All these need a comprehensive macroeconomic modelling and subsequent policies must be suitably framed.

IX. Conclusion

It may be concluded that the problems facing the infrastructural sectors must be immediately addressed. This requires marked changes in procedures, rules, institutions, policies and ownership patterns of these sectors. Apart from looking at Returns, Productivity, Efficiency, Equity and Public Interest, these shifts in Policy or practical working of various institutions in suitable created mechanism must also support the vision of Infrastructure and Development being complementary to each other. Proper identification of necessary projects, smooth and quick completion of construction, proper operation and profitable management of the services, and regular maintenance of them would help the economy to have an efficient infrastructure on which to build up the 'super structure'. Only if

those steps are taken, can we hope to exploit the potential of the infrastructural sector up to the fullest extent and fulfil the objectives of balanced regional development.

- ¹ The India Infrastructure Report-2002 had made an extensive study on the performance, problems and prospects of the different infrastructural sectors in India and has suggested several necessary steps for revitalizing this sector. Refer to 3i Network (2002).
- ² Decentralized planning and implementation have been stressed on by Raj (1971), Pathak (1975), Alagh et al (1987) and Sridharan (1991).

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Table 1
Expenditure on Infrastructural Sectors in Indian Plans - First to Ninth Plan (1951 - 2002)

	Heads of Development	First Plan	Second Plan	Third Plan	Annual Plans	Fourth Plan	Fifth Plan	Annual Plan	Sixth Plan	Seventh Plan	Annual Plans	Eighth Plan	Ninth Plan	Tenth Plan	Total All Plans
		1951-56	1956-61	1961-66	1966-69	1969-74	1974-79	1979-80	1980-85	1985-90	1990-92	1992-97	1997-2002	2002-07	1951-2002
1	Irrigation and flood control	434 (22.1)	430 (9.2)	665 (7.8)	471 (7.1)	1354 (8.6)	3877 (9.8)	1288 (10.6)	10930 (10)	16590 (7.6)	8206 (6.7)	27398 (5.6)	63047 (7.5)	103315 (6.8)	238005 (7.0)
2	Power	149 (7.6)	452 (9.7)	1252 (14.6)	1213 (18.3)	2932 (18.6)	7399 (18.8)	2240 (18.4)	18299 (16.7)	37895 (17.3)	25906 (21)	76724 (15.8)	115869 (13.7)	252055 ^a (16.5)	542385 (16.0)
3	Transport and Communication	518 (26.4)	1261 (27)	2112 (24.6)	1222 (18.4)	3080 (19.5)	6870 (17.4)	2045 (16.8)	17669 (16.2)	37974 (17.4)	23951 (19.5)	101542 (20.9)	215685 (25.6)	324945 (21.3)	738874 (21.8)
4	Social Services	473 (24.1)	855 (18.3)	1493 (17.4)	976 (14.7)	2688 (17)	6834 (17.3)	1968 (16.2)	15917 (14.6)	34960 (16)	19906 (16.2)	88804 (18.3)	199766 (23.7)	347391 (22.8)	722031 (21.3)
	4a. Education	149 (7.6)	273 (5.8)	661 (7.7)	354 (5.3)	905 (5.7)	1710 (4.3)	354 (2.9)	2977 (2.7)	7686 (3.5)	4916 (4)	21597 (4.4)	52173 (6.2)	b	93755 ^c (5)
	4b. Medical, Public health & Family wlfrr.	98 (5)	228 (4.9)	251 (2.9)	140 (2.1)	336 (2.1)	761 (1.9)	223 (1.8)	3412 (3.1)	6809 (3.1)	3771 (3.1)	14105 (2.9)	34387 (4.1)	b	64521 ^c (3.5)
	4c. Other social services	226 (11.5)	354 (7.6)	581 (6.8)	482 (7.3)	1447 (9.2)	4363 (11.1)	1390 (11.4)	9528 (8.7)	20465 (9.4)	11219 (9.1)	53091 (10.9)	113206 (13.4)	b	216352 ^c (11.6)
5	Infrastructure (1+2+3+4)	1574	2998	5522	3882	10054	24980	7541	62814	127418	77967	298468	594367	1027706 ^a	2245291
6	Total Plan Outlay	1960	4672	8577	6625	15779	39426	12177	109292	218730	123120	485455	844031	152563 ₉	3395483
7	Infrastructure as % of total	80.3	64.2	64.4	58.6	63.7	63.4	61.9	57.5	58.3	63.3	61.5	70.4	67.4	66.1

Note: Figures in Parenthesis are Percentages to Total Plan Outlay of that Year; a – For Tenth Plan Outlay on Power includes Central Outlay on Power and States/UTs outlay on Energy, but this difference in coverage is minor; b – For Tenth Plan, sectoral break-up within Social Services is not available; c – First to Ninth Plan only, Total Social Services however includes Tenth Plan also.

Source: Economic Survey, Govt. of India - Various Years, Tenth Plan Documents from www.planningcommission.nic.in.

Table 2
Plan Expenditure on Infrastructural Sectors in India in Recent Years (Centre and States/UTs combined) – Rs. Crores

Sectors	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02
Irrigation and flood control	3974 (6.8)	4232 (6.5)	4705 (6.5)	5370 (6.1)	6104 (6.2)	7245 (6.7)	7974 (6.7)	9905 (7.6)	10814 (7.1)	14210 (8.8)	13529 (7.3)	14589 (6.7)
Power	11388 (19.5)	14518 (22.4)	12157 (16.7)	14773 (16.8)	16346 (16.7)	16511 (15.4)	16937 (14.2)	19396 (14.9)	21159 (14)	21327 (13.3)	28015 (15.1)	25972 (12)
Transport	8074 (13.8)	9314 (14.4)	10662 (14.6)	11976 (13.6)	12096 (12.3)	13766 (12.8)	16670 (14)	18101 (13.9)	20347 (13.4)	23463 (14.6)	25734 (13.9)	41696 (19.3)
a. Railways	4893 (8.4)	5393 (8.3)	6162 (8.5)	5901 (6.7)	5472 (5.6)	6335 (5.9)	8310 (7)	8239 (6.3)	8857 (5.8)	9057 (5.6)	9395 (5.1)	8578 (4)
b. Others	3182 (5.5)	3921 (6.1)	4500 (6.2)	6075 (6.9)	6624 (6.7)	7431 (6.9)	8360 (7)	9862 (7.6)	11490 (7.6)	14406 (9)	16339 (8.8)	33118 (15.3)
Communications	2948 (5.1)	3614 (5.6)	5150 (7.1)	6201 (7)	7273 (7.4)	8626 (8)	9122 (7.7)	10132 (7.8)	11376 (7.5)	14039 (8.7)	31881 (17.2)	18916 (8.7)
Social Services	9607 (16.5)	10299 (15.9)	11322 (15.5)	14016 (15.9)	17409 (17.7)	20848 (19.4)	25209 (21.2)	26867 (20.7)	38738 (25.6)	38439 (23.9)	40919 (22)	54803 (25.3)
Education	2317 (4)	2599 (4)	2619 (3.6)	3147 (3.6)	3940 (4)	5355 (5)	6536 (5.5)	7657 (5.9)	9684 (6.4)	10000 (6.2)	11690 (6.3)	13142 (6.1)
Medical & Public Health	1041 (1.8)	925 (1.4)	1213 (1.7)	1300 (1.5)	1625 (1.7)	1929 (1.8)	2068 (1.7)	2642 (2)	5412 (3.6)	3569 (2.2)	4055 (2.2)	4929 (2.3)
Family welfare	782 (1.3)	1023 (1.6)	1008 (1.4)	1312 (1.5)	1684 (1.7)	1743 (1.6)	223 (0.2)	1822 (1.4)	2343 (1.5)	2969 (1.8)	3200 (1.7)	3446 (1.6)
Housing	940 (1.6)	604 (0.9)	650 (0.9)	1291 (1.5)	1055 (1.1)	1356 (1.3)	3177 (2.7)	2118 (1.6)	3143 (2.1)	3516 (2.2)	3588 (1.9)	7522 (3.5)
Urban Development	740 (1.3)	748 (1.2)	791 (1.1)	855 (1)	1025 (1)	1535 (1.4)	2064 (1.7)	2944 (2.3)	2821 (1.9)	2823 (1.8)	3143 (1.7)	6206 (2.9)
Other Social Services	3787 (6.5)	4399 (6.8)	5039 (6.9)	6109 (6.9)	8077 (8.2)	8928 (8.3)	11139 (9.4)	9685 (7.5)	15335 (10.1)	15562 (9.7)	15242 (8.2)	19558 (9)
Total Infrastructure	35991.1 (61.7)	41976.2 (64.8)	43996 (60.4)	52336 (59.4)	59228 (60.3)	66996 (62.4)	75912 (63.8)	84401 (65)	102434 (67.6)	111478 (69.4)	140078 (75.4)	155976 (72.1)
Total Plan Outlay	58369.3	64751.2	72852	88080	98167	107380	118976	129757	151580	160608	185737	216349

Note: Figures in Parenthesis are Percentages to Total Plan Outlay of that Year
Source: Economic Survey, Govt. of India - Various Years

1. Table 3
(1) Indicators of infrastructure - Global Comparisons

Country	GNP Per Capita	Area	Population	Installed Power Capacity	Power generated	Telephone Main Lines	Railway	Total Road Length	Surfaced Road Length	Surfaced Road Length	Density on Roads	NIA as % of total cropped area	Access to safe drinking water	Physicians	Primary Teachers
	US \$	1000 sq km	Million	KW per million population	KWH per million population	per thousand population	KM per 1000 sq km area			% of total road length	KM per Million Population		% of population	per million population	per 1000 population
Bangladesh	220	144	114.4	22.03	22.03	2113	19	94	55	58.5	118.3	20.4	78	NA	16
India	310	3288	883.6	86.01	84.54	5743	18	599	291	48.6	2229.0	13.8	73	406	17
Kenya	310	580	25.7	28.13	28.13	6811	4	105	21	20.0	2369.6	0.1	49	98	32
Pakistan	420	796	119.3	78.35	76.59	7069	11	212	64	30.2	1414.5	21.3	55	340	24
China	470	9561	1162.2	118.65	118.65	5894	5	107	21	19.6	880.3	4.9	72		45
Low income	390	38929	3191.3	NA	53	6	NA	NA	NA	NA	396.0	NA	62	89	26
Indonesia	670	1905	184.3	70.10	62.29	5785	3	149	65	43.6	1540.1	4.3	34	142	43
Philippines	770	300	64.3	109.19	106.83	9487	1	535	77	14.4	2496.1	5.2	81	123	30
Middle income	2490	62470	1418.7	NA	373	81	NA	NA	NA	NA	1335.0	NA	74	495	40
Australia	17260	7713	17.5	2057.83	2101.83	444965	4	105	37	35.2	46278.0	0.2	100	NA	59
UK	17790	245	57.8	1263.20	1264	438893	67	1455	1455	100.0	6167.4	0.7	100	NA	50
Canada	20710	9976	27.4	3800.73	3800.73	558241	8	82	28	34.1	29855.2	0.1	100	2222	67
USA	23240	9373	255.4	2871.31	3036.01	533817	22	666	387	58.1	24441.7	2	100	2381	NA
Japan	28190	378	124.5	1564.10	1564.36	437975	53	2962	2040	68.9	8993.1	7.5	96	1639	48
High income	22160	31709	828.1	NA	2100	442	NA	NA	NA	NA	10106.0	NA	96	2381	59

Source: WDR (2002), and Economic Survey, Govt. of India - Various Year